



Ballard Family Dairy & Cheese

Gooding, Idaho

Winner: Outstanding Achievement in Energy Efficiency

Energy Efficient Upgrades Benefit Dairy and the Environment

In 1995, Steve and Stacie Ballard started their 35-acre dairy in Gooding, Idaho, with their son Travis. In 2004, the family added a cheese facility adjacent to their barn to take advantage of the milk from their Jersey herd. Ballard Family Dairy & Cheese has grown to 110 milking and dry cows and 80 young stock that produce 1,320,000 pounds of milk annually.

The Ballards recognized that in order to stay competitive, they would need to aggressively manage their expenses – specifically, energy costs and consumption. Like many rural farmers, they relied on propane, an expensive and price-volatile fuel. The family aimed to eliminate their propane dependence and reduce their overhead by 10 percent.

To achieve their goals, the Ballards explored energy efficiency upgrades and infrastructure changes. They worked with a cross-functional team, including engineers and contractors, dairy associations, the USDA, the U.S. Department of the Treasury, the Idaho Power Company and their local bank, to develop a custom efficiency project for their dairy.

The project included power phase conversion, automation and controls, improved ventilation, installation of VFD vacuum pumps and high-efficiency modulation electric boilers, in addition to the best practices detailed below.

Best Practices

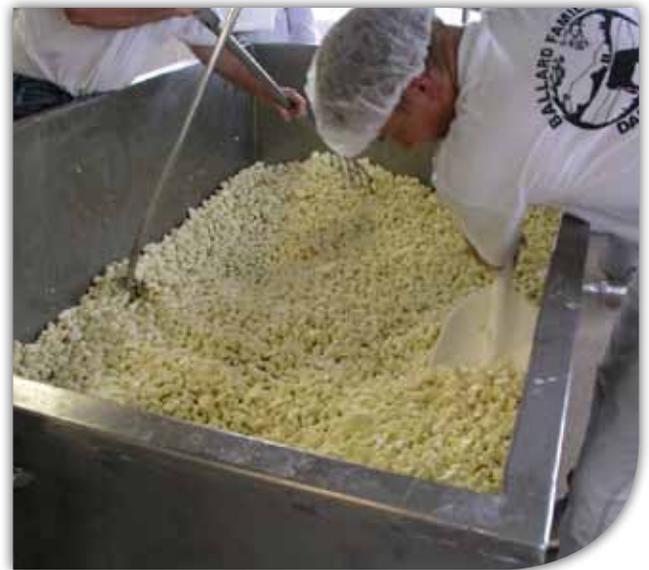
1 Hot Water System

Summary

Ballard Family Dairy & Cheese originally used a propane-fired steam boiler system, which was operating at 33 percent efficiency and consumed approximately 664 MMBTU per year. The family decided to replace the boiler system with an evacuated tube collector solar thermal supply, heat pump and high-efficiency electric boiler. In making these upgrades, the dairy was able to switch from propane to all-electric, which resulted in a 50 percent reduction in fossil fuel use (due to the electric provider's energy mix).

Key benefits

The new system has helped the Ballards achieve a 67 percent energy savings. Solar thermal now supplies approximately 50 percent of their heating load. Designed to meet the needs of the dairy as it expands, the hot water system has already resulted in \$15,000 in savings and a carbon dioxide reduction of 89,500 pounds.



2 LED Lighting

Summary

The dairy originally used a combination of incandescent, T-12 tube, halogen and high-intensity discharge lights. After evaluating the results of their energy audit, the Ballards upgraded all of their lighting to energy efficient LED. They also added automatic lighting controls to help capture additional savings.

Key benefits

Proof that small upgrades can make a big difference, the switch to LED lighting has resulted in an annual energy savings of 35,000 kilowatt hours (kWh) and a cost savings of \$2,500. And it's good for the environment – the Ballards estimate that their dairy has reduced its carbon dioxide output by 5,500 pounds through this update.

3 Milk Cooling

Summary

The milk cooling system at Ballard Family Dairy & Cheese originally carried fresh milk at 100 F through a heat exchanger that used 60 F ground water to cool the milk. The milk left the heat exchanger at 80 F and was further cooled to 40 F in a chiller. The new system uses residual 40 F cold water from the heat pump system. This pre-cools the milk to 60 F and results in the chiller cooling the milk from 60 to 40 F. The Ballards also added a more efficient plate heat exchanger.

Key benefits

By making a change to the milk cooling system, the Ballards identified an opportunity to reduce water use and save money. The upgrades save an estimated 1,000 gallons daily and provide relief to the depleted local aquifer. The family also has achieved significant annual savings including cost savings of \$2,000, energy savings of 27,000 kWh and carbon dioxide savings of 11,500 pounds.

The total project cost for Ballard Family Dairy & Cheese was \$130,000 with a 5.5-year payback period and a simple ROI of 18 percent. The total annual savings from the energy reduction upgrades is \$23,700 – more than 10 percent of the dairy's overhead. The project also virtually eliminated the dairy's need for propane, which saves approximately \$15,000 annually.

The Ballards anticipate that the actual payback will be sooner than originally forecasted. As their operation expands, they require less overall energy than they would have with their previous system. The Ballards believe that every farm has some aspect of energy management that can be improved, and – with proper direction and support – all dairies can improve their environmental impact and bottom line.



The Sustainability Awards are part of the U.S. Dairy Sustainability Commitment, an industrywide effort to measure and improve the economic, environmental and social sustainability of the dairy industry. The award program recognizes dairy farms, businesses and collaborative partnerships for their contributions to healthy people, healthy products and a healthy planet and showcases that sustainability makes good business sense. An independent panel of judges evaluate all nominations based on the program's or project's results as measured by triple-bottom-line success – economic, environmental and social. For more information, please visit USDairy.com/Sustainability/Awards.